

Remarks

Reconsideration of remaining claims 12, 15-16, 18, 20, 29-32, 37-38 is respectfully requested. Applicant also requests consideration of newly-submitted claims 39-42.

In the Office action dated February 28, 2003 (application Paper No. 10), the Examiner rejected various combinations of the pending claims under 35 USC §§ 112, second paragraph, 102(b), 102(e) and 103(a). The Examiner's various rejections will be addressed below in the order appearing in the Office action.

Election/Restriction

Applicant confirms the election of claims 12, 15-16, 18, 20, 29-32, 37-38. As stated by the Examiner in the Action dated November 26, 2002, claims 12 and 28 are defined as "generic" claims, and the allowability of the remaining, non-elected claims will be re-considered upon allowance of claims 12 and 28.

Drawings

As requested by the Examiner, formal drawing sheets for the approved drawing corrections are being filed with this response.

35 USC § 112, second paragraph Rejection – Claims 12, 15-20, 28-32 and 37

The Examiner first rejected the above-cited claims under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the present invention. In particular, the Examiner cited the term "the light coupling portion" as recited at line 8 of claim 12 as lacking proper antecedent basis. In response, applicant has amended claim 12 to remove any recitation of a "light coupling portion. Claim 20 was cited by the Examiner as including the phrase "thickness of less than 0.5 μ ", where the symbol " μ " is considered to be insufficient in defining a thickness value. In response, applicant has amended claim 20 to recite "0.5 μ m" and believe that claim 20 is now in condition for allowance.

In light of the amendments to claims 1 and 20, applicant respectfully requests the Examiner to reconsider the 35 USC 112, second paragraph rejections and find claims 1 and 20, as well as claims 15, 16, 18 and 29-32,37 which respectively depend therefrom, to be in condition for allowance.

35 USC § 102(b) Rejection – Claims 12, 17, 20, 28, 30, 31, 32 and 38

The above-cited claims were rejected by the Examiner under 35 USC 102(b) as being anticipated by US Patent 4,966,430 (Weidel). In response, applicant has amended independent claim 12 and asserts that Weidel does not disclose, suggest, or anticipate any use of “evanescent coupling” for “optically coupling the deflected light into the waveguide, such that light emitted from the light deflector can pass via the evanescent coupling gap region to the relatively narrow waveguide at a suitable mode angle”, as defined by amended claim 12. Weidel discloses the use of traditional optical waveguides (such as waveguide 5) to support the propagation of light, where the waveguides are of a size such that a mirrored surface (mirror 8) of Weidel can merely re-direct propagation of light from an optical transducer 7 into waveguide 5.

In contrast, the arrangement of the present invention is related to optical transmission within a relatively thin (e.g. less than 3 μm) waveguide along a surface of an SOI structure. The use of an SOI structure, with a waveguide formed in a “thin upper silicon layer” is also not disclosed in Weidel, as that structure is defined in the specification. Lastly, independent claim 12 defines the use of a “light deflector” that is “configured to deflect light impinging at the suitable incident angle to a suitable mode angle where light deflected by the light deflector enters the relatively narrow waveguide”, where embodiments of this deflector may comprise a grating, prism or coupling lens.

Based on these differences, therefore, applicant respectfully requests the Examiner to reconsider this rejection and find remaining claims 12, 20, 3-32 and 38 to be in condition for allowance.

35 USC § 102(b) Rejection – Claims 12, 15, 18, 19, 28, 31, 32, 37 and 38

The Examiner next rejected the above-cited claims under 35 USC 102(b) as anticipated by US Patent 5,502,779 (Magel). As with the Weidel reference, applicant asserts that Magel does not disclose or suggest the use of “evanescent coupling” as that term is defined by the rejected claims. Nor is there any disclosure in Magel regarding the use of a “light deflector” to “deflect light impinging at the suitable incident angle to a suitable mode angle where light deflected by the light deflector enters the relatively narrow waveguide”. The structure of Magel includes a relatively wide waveguide 20, where evanescent coupling at the proper “mode angle” is not a concern.

Applicant therefore respectfully requests the Examiner to reconsider this rejection and find remaining claims 12, 15, 18, 31, 32, 37 and 38 to be in condition for allowance.

35 USC § 102(e) Rejection – Claims 12, 15, 18, 19, 28-30, 37 and 38

Claims 12, 15, 18, 19, 28-30, 37 and 38 were next rejected by the Examiner under 35 USC 102(e) as being anticipated by US Patent 6,393,169 (Paniccia et al.). As with the above references, applicant asserts that Paniccia et al. discloses an optical structure that utilizes conventional optical coupling techniques, in this case, allowing an incoming light signal to pass through an opening (or via) 821 before impinging a “deflector” 825.

Waveguide 897 of Paniccia et al. is disclosed as a conventional, relatively wide waveguide, capable of supporting many signal modes. In contrast, the use of the relatively narrow waveguide of the invention as defined by rejected independent claim 12 requires “evanescent coupling” as the method to couple the optical energy out of the “input” waveguide and into the “narrow” waveguide. The arrangement of Paniccia et al. cannot support such a coupling requirement.

Applicant therefore respectfully requests the Examiner to reconsider this rejection and find remaining claims 12, 15, 18, 29, 30, 37 and 38 to be in condition for allowance.

35 USC § 103(a) Rejection – Claim 16

The Examiner next rejected claim 16 under 35 USC 103(a) as being unpatentable over Paniccia et al., as above, where the Examiner cited regions 821 and 823 as being likened to the “evanescent coupling region” defined by rejected claim 12 (from which claim 16 depends). In response, applicant asserts that regions 821 and 823 are simply “optical conduits” that do not effect the angular displacement of a propagating wave and cannot be found to disclose or suggest the phenomena of “evanescent coupling” as that term is known and used in the present specification and rejected claims. Without this teaching, Paniccia et al. cannot be found to render obvious the subject matter of claim 16. Applicant therefore respectfully requests the Examiner to reconsider this rejection and find claim 16 to be in condition for allowance.

Summary

Each of the Examiner’s rejections has now been responded to and applicant requests the Examiner to reconsider the various rejections. If the Examiner believes that an interview or telephone conversation would further the prosecution of this application, the Examiner is invited to contact applicant’s attorney at the telephone number listed below.

Respectfully submitted,

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